

**Louisiana Department of Environmental Quality (LDEQ)
Office of Environmental Services**

STATEMENT OF BASIS

**ConocoPhillips Company
Lake Charles Refinery
Westlake, Calcasieu Parish, Louisiana
Agency Interest Number: 2538
Activity Numbers: PER20070046, 47, 48, 49, 50
Proposed Permit Numbers: 2623-V5, 2625-V5, 2626-V6, 2627-V5, PSD-LA-735**

I. APPLICANT

Company:
ConocoPhillips Company
2200 Old Spanish Trail
Westlake, Louisiana 70669

Facility:
Lake Charles Refinery
2200 Old Spanish Trail
Westlake, Calcasieu Parish, Louisiana
Approximate UTM coordinates are 473.405 kilometers East and 3,345.357 kilometers North in Zone 15

II. FACILITY AND CURRENT PERMIT STATUS

Lake Charles Refinery (LCR) processes crude oils into chemical and petrochemical feedstock, gasoline, heating oil, residual fuels, petroleum coke, lube oils, and other miscellaneous products. To refine the crude, it utilizes crude-topping units, crude vacuum units, a fluid catalytic cracking unit, an alkylation unit, a polymerization unit, catalytic reformers, desulfurization units, petroleum coking units, a calcining unit, sulfur recovery units, a hydrodewaxer unit, a hydrofinisher unit and associated infrastructure including plant utilities. Lake Charles Refinery is organized into Area A, Area B, Area C, Area D, and Excel Paralubes. ConocoPhillips Company presently operates this refinery under the following permits:

PSD-LA-390	granted 08/10/1981
PSD-LA-419	granted 10/08/1981
PSD-LA-533 (M-3)	granted 07/02/1993
PSD-LA-584 (M-4)	granted 05/19/2006
PSD-LA-699	granted 05/28/2004

**ConocoPhillips Company
Lake Charles Refinery
Westlake, Calcasieu Parish, Louisiana
Agency Interest Number: 2538**

2623-V4	granted 02/08/2008 (for Area A)
2624-V7	granted 12/21/2007 (for Area B)
2625-V4	granted 08/24/2005 (for Area C)
2626-V5	granted 07/17/2007 (for Area D)
2627-V4	granted 07/25/2008 (for Excel Paralubes)

In addition, the Lake Charles Refinery is one of four refineries included in the Consent Decree lodged December 20, 2001 (Civil Action Number H-01-4430 filed in the United States District Court for the Southern District of Texas).

III. PROPOSED PROJECT/PERMIT INFORMATION

Application

A permit application dated December 20, 2007 was submitted requesting PSD permit for the Ultra-Low Sulfur Diesel Project and Part 70 operating permit modifications to the project affected areas – Area A, Area C, Area D, and Excel Paralubes. Additional information, dated January 11, June 2 and 10, July 25, and August 12, 15, 25, & 28, 2008, was also received.

Project

EPA's Heavy-Duty Highway Diesel program, finalized in 2001, is a comprehensive national program that will greatly reduce emissions from diesel engines by integrating engine and fuel control as a system to gain the greatest air quality benefits. The program requires refiners and fuel importers to reduce the sulfur content of highway diesel fuel by 97 percent, from 500 ppm to 15 ppm. The cleaner-burning diesel fuel is referred to as Ultra-Low Sulfur Diesel (ULSD). The fuel provisions became effect in June 2006 and will be phased in through 2009.

The ConocoPhillips Lake Charles Refinery is proposing the ULSD Project to make modifications to its operations so that it will achieve full compliance with EPA diesel regulations – 40 CFR 80 Subpart I. In order to remove enough sulfur from the diesel pool to achieve the required low sulfur standards, the following new sources will be added for the ULSD project:

- Installation of a new 70,000 barrels per day (BPD) distillation hydrotreater unit, the No. 9 HDS, to produce primarily ultra low sulfur diesel along with other low sulfur products. This unit will employ two new process heaters, H-38251 Feed Heater and H-38252 LP Splitter Reboiler. These heaters will be equipped with ultra-low NO_x burners (ULNB) with air pre-heater.
- Installation of a new 200 long ton per day (LTPD) sulfur recovery unit, the No. 6 SRU. The No. 6 SRU will have a Claus unit, a converter section, a tail gas unit, and a thermal oxidation section.

**ConocoPhillips Company
Lake Charles Refinery
Westlake, Calcasieu Parish, Louisiana
Agency Interest Number: 2538**

- Installation of a new 21 MM scf/day Refinery Saturated Gas Plant (RSGP) to process off gas from the HDS units and to reduce the load on the existing Gas Recovery Plant. This unit will have a glycol regeneration vent that routinely vents to the North Flare, which is equipped with a flare gas recovery system to capture the vapors and send them to the refinery fuel gas system.
- Construction of a new 4,000 BPD Merox Unit (RSGP Merox) within the RSGP to remove mercaptan sulfur from the RSGP P-B stream. Excess air, used as an oxygen source in the oxidizer, will be vented from the disulfide separator, enriched with refinery fuel gas, and then combusted in the No. 2 Calciner.
- Installation of a new 350 gpm sour water stripper, the No. 6 SWS. This unit will have a sour water flash drum vent that routinely vents to the North Flare.
- Construction of two new fixed roof sour water storage tanks, T-73001 and T-73002.
- Construction of a new fixed roof sulfur storage tank, T-57080. The emissions from this tank will be vented to the No. 6 SRU for processing.
- Installation of a new 1,150 gpm Amine Regeneration Unit.
- Installation of a new 24,000 gpm Cooling Water Tower, Y-8.

This project will also make the following modifications to the existing sources:

- Modifications to the No. 6 HDS Unit to produce 25,000 BPD of ultra low sulfur diesel in conjunction with other low sulfur products that are currently produced by this unit. The existing process heater, H-3101, will be replaced with a new furnace, H-74001, and will be designed to have a ULNB with air pre-heat.
- Modifications to the No. 4 HDS to be able to produce ultra low sulfur kerosene (ULSK) in conjunction with other low sulfur products that are currently produced by this unit.
- Modifications to the No. 5 HDS to be able to produce ultra low sulfur light straight run (LSR) gasoline in conjunction with other low sulfur products that are currently produced by this unit.
- Increasing the permitted throughput for the lean amine tank T-66001 and the fresh amine tank T-66003.
- Changing the service for Tank T-2004 from Hot Resid storage to cracked diesel.
- Increasing sulfur loading at the Excel LOHC Sulfur Loading Rack.

**ConocoPhillips Company
Lake Charles Refinery
Westlake, Calcasieu Parish, Louisiana
Agency Interest Number: 2538**

With the addition of the new sulfur recovery unit (No. 6 SRU) to process hydrogen sulfide streams and the new gas plant (RSGP) to process off gas, the refinery will remove current processing constraints resulting from the limitations of the existing sulfur recovery trains and availability of the fuel gas system. These systems will have fewer downtime days because of the added sulfur treating capacity. This will result in an increase in the annual processing rates of other units at the refinery due to the increase of total number of operating days on an averaging annual basis. However, these units will not have a capacity increase because of the ULSD Project.

Hydrogen is required to complete the desulfurization reaction within the HDS units. The refinery does not produce sufficient amounts of hydrogen to supply all of the units that utilize hydrogen. Therefore, hydrogen is supplied by off-site facilities. As part of the ULSD Project, a new hydrogen feed line will be installed to supply the additional hydrogen. Hydrogen supply is also a current constraint on the refinery and the addition of the new hydrogen feed line will remove this constraint. These units will not have a capacity increase because of the ULSD Project, but they will be able to increase the total number of operating days on an averaging annual basis. This will result on an increase of production on an annual basis, and an associated increase in emissions.

The ULSD Project will also affect wastewater treatment system, storage tanks, loading operations, and steam balance.

Proposed Permits

Permit PSD-LA-735 performs the PSD review for the ULSD Project. The project affects Area A, Area C, Area D, and Excel Paralubes at the Lake Charles Refinery. Permits 2623-V5, 2625-V5, 2626-V6, and 2627-V5 are the modified Part 70 operating permits for these areas.

Permitted Air Emissions

Estimated emissions from the Area A in tons per year are as follows:

<u>Pollutant</u>	<u>Before</u>	<u>After</u>	<u>Change</u>
PM ₁₀	162.15	165.92	+ 3.77
SO ₂	632.99	635.28	+ 2.29
NO _x	596.63	593.64	- 2.99
CO	169.05	176.90	+ 7.85
VOC	219.25	256.54	+ 37.29

**ConocoPhillips Company
Lake Charles Refinery
Westlake, Calcasieu Parish, Louisiana
Agency Interest Number: 2538**

Estimated emissions from the Area C in tons per year are as follows:

<u>Pollutant</u>	<u>Before</u>	<u>After</u>	<u>Change</u>
PM ₁₀	66.66	70.79	+ 4.13
SO ₂	87.79	93.47	+ 5.68
NO _x	385.48	404.90	+ 19.42
CO	161.89	184.09	+ 22.20
VOC	264.22	266.32	+ 2.10

Estimated emissions from the Area D in tons per year are as follows:

<u>Pollutant</u>	<u>Before</u>	<u>After</u>	<u>Change</u>
PM ₁₀	0.97	0.97	-
SO ₂	1.22	1.22	-
NO _x	14.33	14.33	-
CO	37.50	37.50	-
VOC	578.74	581.27	+ 2.53

Estimated emissions from the Excel Paralubes in tons per year are as follows:

<u>Pollutant</u>	<u>Before</u>	<u>After</u>	<u>Change</u>
PM ₁₀	27.89	30.62	+ 2.73
SO ₂	317.22	417.98	+ 100.76
NO _x	161.37	178.89	+ 17.52
CO	192.20	227.44	+ 35.24
VOC	147.51	188.02	+ 40.51

IV REGULATORY ANALYSIS

The applicability of the appropriate regulations is straightforward and provided in the Specific Requirements section of each proposed Part 70 operating permit. Similarly, the Monitoring, Reporting and Recordkeeping necessary to demonstrate compliance with the applicable terms, conditions and standards are also provided in the Specific Requirements section of each proposed Part 70 operating permit.

Prevention of Significant Deterioration/Nonattainment Review

All ULSD Project affected sources have been considered for estimating the emission increases. The baseline actual emissions for the affected sources are the average annual emissions during the 24-month period between January 1, 2005

**ConocoPhillips Company
Lake Charles Refinery
Westlake, Calcasieu Parish, Louisiana
Agency Interest Number: 2538**

and December 31, 2006. The estimated project emission increases are (in tons per year):

Pollutants	Baseline Actual	Projected Emissions	Emission Increases	PSD <i>De Minimis</i>	Netting Required?
PM ₁₀	167.26	180.47	13.21	15	No
SO ₂	265.71	378.50	112.79	40	Yes
NO _x	593.25	646.67	53.42	40	Yes
CO	329.84	401.06	71.22	100	No
VOC	792.94	890.12	97.18	40	Yes
H ₂ SO ₄	0.29	4.18	3.89	7	No
H ₂ S	< 0.01	2.97	2.97	10	No

The projected emissions listed in the table above are potential emissions from the ULSD Project affected sources except the units affected by the changes to the sulfur plants, fuel gas recovery plants, and hydrogen supply. Emissions from these units are estimated based on the projected future actual throughput. Post-project monitoring on these units is required.

In this analysis, all particular matter emitted from the affected sources is considered as PM₁₀. As shown in the table above, the ULSD Project will result emission increases (project increases only) over the PSD significant levels for SO₂, NO_x, and VOC. Netting analysis for these pollutants is required.

It is proposed that the on-site construction of the ULSD Project will begin in March 2009 and the project is expected to commence full startup prior to June 2011. Therefore, the PSD contemporaneous period for this project is from March 2004 to June 2011. The contemporaneous emission changes are presented in the table below:

<u>Pollutant</u>	<u>Project Increases</u>	<u>Project Decreases</u>	<u>Contemporaneous Changes</u>	<u>Net Emissions Change</u>	<u>PSD de minimis</u>	<u>PSD Review Required?</u>
SO ₂	112.79	- 0.18	- 163.79	- 51.18	40	No
NO _x	53.42	- 9.25	+ 96.51	+ 140.68	40	Yes
VOC	97.18	- 0.13	+ 93.21	+ 190.26	40	Yes

The results of the netting analysis indicate that the net emission increases of NO_x and VOC are over their respective PSD significant levels. Therefore, PSD review for NO_x and VOC is required.

The PSD review is conducted in the proposed Permit PSD-LA-735. The net emission increases of NO_x and VOC are above PSD significance levels and must undergo BACT analyses. The sources that are subject to NO_x BACT analysis include process heaters (H-74001, H-38251, H-38252) and No. 6 SRU. The sources that are subject to VOC BACT analysis include process heaters (H-74001, H-38251, H-38252), No. 6 SRU, Y-8 Cooling Tower, process fugitive emissions

**ConocoPhillips Company
Lake Charles Refinery
Westlake, Calcasieu Parish, Louisiana
Agency Interest Number: 2538**

(Process Fugitives in Area A, C, and D, and Excel Paralubes), wastewater fugitive emissions (Area A Drains, Sumps & Junction Boxes and Excel Paralubes Drains, Sumps & Junction Boxes), and storage tanks (Cone Roof Tank T-2004, Cone Roof Tank T-66001, and Cone Roof Tank T-66003). The selection of control technology was based on the BACT analysis using a "top down" approach. The BACT determination is summarized in the table below:

Affected Unit	BACT Determination
Process Heaters (H-74001, H-38251, H-38252)	NO _x BACT: ULNB with air pre-heat VOC BACT: Proper Burner (ULNB) Design and Operation
No. 6 Sulfur Recovery Unit	NO _x BACT: ULNB with air-fuel ratio control VOC BACT: Optimized air-fuel ratio control
Storage Tank T-2004	VOC BACT: Compliance with NESHAP Part 63 Subpart CC
Storage Tank T-66001	VOC BACT: Compliance with NSPS Subpart Kb
Storage Tank T-66001	VOC BACT: No control
Process Fugitive Emissions	VOC BACT: Compliance with the consolidated fugitive program with more stringent leak definitions
Wastewater Fugitive Emissions	VOC BACT: Compliance with NESHAP Part 61 Subpart FF and NSPS Subpart QQQ
Cooling Tower (Y-8)	VOC BACT: Monthly VOC monitoring

Streamlined Equipment Leak Monitoring Program

It is required that the Lake Charles Refinery comply with a streamlined equipment leak monitoring program. Compliance with the streamlined program shall serve to comply with each of the fugitive emission monitoring programs being streamlined.

For the Lake Charles Refinery, fugitive emissions are subject to the requirements of 40 CFR 61 Subpart V, 40 CFR 60 Subpart GGG, LAC 33:III.2122, and LAC 33:III.5109. (40 CFR 63 Subpart CC is not included in this program.) Among these regulations, Louisiana MACT Determination for the LCR is the overall most stringent program. Therefore, fugitive emissions shall be monitored as required by this program (Louisiana MACT Determination for Refineries).

Unit or Plant Site	Program Being Streamlined	Stream Applicability	Overall Most Stringent Program
Lake Charles Refinery	LAC 33:III.5109 – Louisiana MACT Determination for Refineries	≥ 5% VOTAP	Louisiana MACT Determination for Refineries*
	40 CFR 61 Subpart V	≥ 5% VOHAP	
	40 CFR 60 Subpart GGG	≥ 10% VOC	
	LAC 33:III.2122 – Louisiana Fugitive Emission Control for Specified Parishes	≥ 10% VOC	

**ConocoPhillips Company
Lake Charles Refinery
Westlake, Calcasieu Parish, Louisiana
Agency Interest Number: 2538**

Per BACT determination, the following leak definitions will be used in the streamline equipment leak monitoring program:

Component	Leak Definition (ppmv)
Valves – Light liquid service	500
Valves – Heavy liquid service	No visual leaks
Valves – Gas/vapor service	500
Pumps – Light liquid service	2,000
Pumps – Heavy liquid service	No visual leaks
Pressure Relief Valves – Gas/vapor service	500
Pressure Relief Valves – Liquid service	500
Connectors – Light liquid service	500
VOC Compressors	5,000
Closed Vent Systems	500

MACT Requirements

The facility is subject to Louisiana MACT Determination for Refineries and 40 CFR Part 63, Subparts CC, UUU, and EEEE. Detailed requirements are listed in the Specific Requirements Section of each proposed Part 70 operating permit.

Air Quality Analysis

Air quality analysis is performed for NO_x and VOC emissions. AERMOD modeling of NO_x emissions from the proposed project indicates that the maximum air quality impact of NO_x (0.770 µg/m³) will be below its PSD significance impact level (1 µg/m³) and preconstruction monitoring level (14 µg/m³). Therefore, pre-construction monitoring, refined NAAQS modeling, area of impact (AOI) determination, and increment consumption analyses were not required for the ULSD Project.

Since the net VOC emission increase (the contemporaneous net emission increase) is greater than 100 tons per year, the PSD regulations require an ozone impact analysis (also referred to as the ozone NAAQS analysis). The Scheffe screening analysis results indicate that the ULSD Project complies with NAAQS for ozone.

General Condition XVII Activities

The facility will comply with the applicable General Condition XVII Activities emissions as required by the operating permit rule. However, General Condition XVII Activities are not subject to testing, monitoring, reporting or recordkeeping requirements. For a list of approved General Condition XVII Activities, refer to

**ConocoPhillips Company
Lake Charles Refinery
Westlake, Calcasieu Parish, Louisiana
Agency Interest Number: 2538**

the Section VIII – General Condition XVII Activities of each proposed Part 70 operating permit.

Insignificant Activities

All Insignificant Activities are authorized under LAC 33:III.501.B.5. For a list of approved Insignificant Activities, refer to the Section IX – Insignificant Activities of each proposed Part 70 operating permit.

V. PERMIT SHIELD

No permit shield is requested.

VI. PERIODIC MONITORING

All monitoring requirements are presented in the Specific Requirements section of each Part 70 operating permit.

VII. GLOSSARY

Carbon Monoxide (CO) – A colorless, odorless gas, which is an oxide of carbon.

Maximum Achievable Control Technology (MACT) – The maximum degree of reduction in emissions of each air pollutant subject to LAC 33:III.Chapter 51 (including a prohibition on such emissions, where achievable) that the administrative authority, upon review of submitted MACT compliance plans and other relevant information and taking into consideration the cost of achieving such emission reduction, as well as any non-air-quality health and environmental impacts and energy requirements, determines is achievable through application of measures, processes, methods, systems, or techniques.

Hydrogen Sulfide (H₂S) – A colorless inflammable gas having the characteristic odor of rotten eggs, and found in many mineral springs. It is produced by the reaction of acids on metallic sulfides, and is an important chemical reagent.

New Source Review (NSR) – A preconstruction review and permitting program applicable to new or modified major stationary sources of air pollutants regulated under the Clean Air Act (CAA). NSR is required by Parts C (“Prevention of Significant Deterioration of Air Quality”) and D (“Nonattainment New Source Review”).

Nitrogen Oxides (NO_x) – Compounds whose molecules consist of nitrogen and oxygen.

Organic Compound – Any compound of carbon and another element. Examples: Methane (CH₄), Ethane (C₂H₆), Carbon Disulfide (CS₂)

**ConocoPhillips Company
Lake Charles Refinery
Westlake, Calcasieu Parish, Louisiana
Agency Interest Number: 2538**

Part 70 Operating Permit – Also referred to as a Title V permit, required for major sources as defined in 40 CFR 70 and LAC 33:III.507. Major sources include, but are not limited to, sources which have the potential to emit: ≥ 10 tons per year of any toxic air pollutant; ≥ 25 tons of total toxic air pollutants; and ≥ 100 tons per year of regulated pollutants (unless regulated solely under 112(r) of the Clean Air Act) (25 tons per year for sources in non-attainment parishes).

PM₁₀ – Particulate matter with an aerodynamic diameter less than or equal to a nominal 10 micrometers as measured by the method in Title 40, Code of Federal Regulations, Part 50, Appendix J.

Potential to Emit (PTE) – The maximum capacity of a stationary source to emit any air pollutant under its physical and operational design.

Prevention of Significant Deterioration (PSD) – A New Source Review permitting program for major sources in geographic areas that meet the National Ambient Air Quality Standards (NAAQS) at 40 CFR Part 50. PSD requirements are designed to ensure that the air quality in attainment areas will not degrade.

Sulfur Dioxide (SO₂) – An oxide of sulfur.

Sulfuric Acid (H₂SO₄) – A highly corrosive, dense oily liquid. It is a regulated toxic air pollutant under LAC 33:III.Chapter 51.

Title V Permit – See Part 70 Operating Permit.

Volatile Organic Compound (VOC) – Any organic compound, which participates in atmospheric photochemical reactions; that is, any organic compound other than those, which the administrator of the U.S. Environmental Protection Agency designates as having negligible photochemical reactivity.

- v) Per BACT requirements of PSD Permit PSD-LA-735, the following leak definitions shall be used in the program:

Component	Leak Definition (ppmv)
Valves – Light liquid service	500
Valves – Heavy liquid service	No visual leaks
Valves – Gas/vapor service	500
Pumps – Light liquid service	2,000
Pumps – Heavy liquid service	No visual leaks
Pressure Relief Valves – Gas/vapor service	500
Pressure Relief Valves – Liquid service	500
Connectors – Light liquid service	500
VOC Compressors	5,000
Closed Vent Systems	500

Unit or Plant Site	Program Being Streamlined	Stream Applicability	Overall Most Stringent Program
Lake Charles Refinery	LAC 33:III.5109 – Louisiana MACT Determination for Refineries	$\geq 5\%$ VOTAP	Louisiana MACT Determination for Refineries*
	40 CFR 61 Subpart V	$\geq 5\%$ VOHAP	
	40 CFR 60 Subpart GGG	$\geq 10\%$ VOC	
	LAC 33:III.2122 – Louisiana Fugitive Emission Control for Specified Parishes	$\geq 10\%$ VOC	

* Comply with Louisiana MACT Determination for Refineries with exceptions as listed in paragraph iv.